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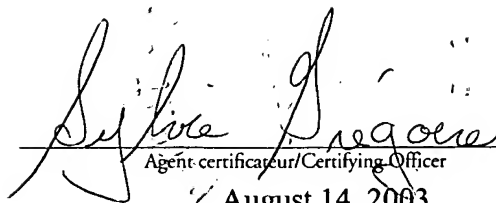
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**ABSTRACT**

A web-based electronic commerce system provides users with marketing content for certain items. The system utilizes personalization technology to provide information usable to generate recommendations to users. The presentation of recommendations to a user is carried out by use of a product exploration or guided search technology. A personalized web page contains links to one or more initial product exploration or guided search web pages, or both. The initial product exploration or guided search web pages contain links to other web pages defined using the respective technologies and the personalization information available regarding the user.

CA9-2003-0031

## SYSTEM AND METHOD FOR PRESENTING PERSONALIZED CONTENT ON ELECTRONIC COMMERCE WEB PAGES

### Field of the Invention

The present invention relates generally to web-based computing systems and more specifically to a system and method for presenting content on web pages in electronic commerce systems.

### Background of the Invention

Web-based electronic commerce (e-commerce) computer systems are used to provide marketing content to users or customers. Such marketing content may be presented by way of banner advertisements, catalogue entries, images, or text entries, all appearing on web pages. It is common for computer systems that provide such marketing content to also include functionality to personalize the marketing content for individual users (consumers) or for specific groups of users. Different computer systems may use a variety of personalization technologies such as rule-based systems, collaborative filtering, neural networks, data mining, and other artificial intelligence approaches to select certain marketing content elements for display to users accessing web-pages provided by the systems. Such prior art systems provide marketing content elements to users, which elements include personalized content that is tailored for the users.

Previous patents disclose different approaches to personalization. One approach uses collaborative filtering technology to personalize marketing content elements presented to a customer or user. Automated collaborative filtering systems have been described as systems which predict a customer's affinity for items or information by connecting recorded customer attributes with those of community of customers and sharing affinity ratings between like-minded customers (see the Association of Computing Machinery paper "*Explaining Collaborative Filtering Recommendations*", Jonathan L. Herlocker, et al., CSCW'00, December 2-6, 2000, Philadelphia, Pennsylvania, U.S.A.).

Different issued patents describe systems based on collaborative filtering. For example, U.S. Patent 5,704,017 (Heckerman et al., December 30, 1997), U.S. Patent 6,041,311 (Chilenko et al., March 21, 2000), U.S. Patent 6,064,980 (Jacobi et al., May 16, 2000), U.S. Patent 6,092,049 (Chilslenko, July 18, 2000), U.S. Patent 6,266,649 (Linden et

al., July 24, 2001), Patent Cooperation Treaty (PCT) application WO 98/33135 (Chislenko et al., July 30, 1998), which all include descriptions of system that implement collaborative filtering. Other recommendation systems may use segmentation of user profiles or a grouping of users based on textual descriptions of products browsed or purchased (see, for example, PCT application WO 01/33410 A2, (Cooper, et al., May 10, 2001) and U.S. Patent 6,356,879 (Aggarwal et al., March 12, 2002), respectively).

The types of approaches referred to above typically provide personalized marketing content elements which are delivered to a user in a way that may include summary information about a product or service with links to web pages having detailed product information on those pages describing the product or service. Alternatively, a link may be provided to web pages that display product or service information within a defined category.

In these types of systems, the delivery of the personalized selections is such that once a personalized web page with links to web pages for products (or services) is provided, navigation is left to the user. The user (consumer) is often faced with a cumbersome process when the user seeks to browse web pages for recommended products or for products within a recommended category or categories. Typically, a consumer will use a browser to follow a link from the personalized web page to a separate web page with detailed information about a first product. Before accessing other pages having information about other products the consumer must use the browser to again display the personalized web page. The user will only then be able to follow other links to reach web pages with detailed information about other products. This back and forth navigation is not convenient for the consumer seeking to access product or service information made available by the web-based e-commerce system. Such an approach also requires the consumer to remember the details of web pages viewed initially to make comparisons with products described on web pages viewed later in the process.

Another drawback for the user is that the web-based system providing the personalized web page will present the product web page links in a manner determined by the personalization algorithms of the e-commerce system. Such presentation may result in less-preferred links being given a higher priority than links that the consumer is more interested in. Alternatively, or in the same process, the personalization system may take steps to make the presentation of recommendations manageable where the potential set of recommendations is

CA9-2003-0031 2

large. The presentation of recommendations by the personalization system may, in this second case, also include the pruning of recommendations (links) based on a method that is arbitrary or based on heuristics implemented in the personalization-system. Such pruning may result in only a small subset of the potential links being displayed for the user.

5 For these reasons, the consumer may be presented with a number of links to product information in which only a subset of those links relate to web pages that the consumer is actually interested in viewing, or may be presented with only a subset of the links that the consumer potentially is interested in. In the first case, the consumer will typically need to follow the different links presented so as to view the details of the products to  
10 determine whether the products are of interest or not. A potentially large number of web pages with undesirable products may be accessed by the user before reaching those web pages relating to products of interest. In the second case, the consumer will be potentially not be provided with links of interest due to the pruning that has been carried out by the personalization system.

15 It is therefore desirable to provide a web-based system for presenting or delivering marketing content to a user or consumer in which personalized information is delivered and in which the marketing content delivery to the user or consumer facilitates the efficient display of web pages of interest.

## 20 Summary of the Invention

Accordingly, the present invention provides a system and method for improved presentation of content to a user using personalization and product exploration metaphor technology.

According to another aspect of the present invention there is provided a computer  
25 program product for providing web-based electronic commerce personalized marketing content to a user, the computer program product including a computer usable medium having computer readable program code means embodied in the medium, and including

computer readable program code means for defining a personalized web page including one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

5 computer readable program code means for defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

10 each initial product exploration web page including an entry point to a set of exploration web pages defined according to product exploration metaphor technology and the set of the exploration web pages being defined with reference to personalization information for the user, and

15 each initial guided search web page including an entry point to a set of guided search web pages defined according to guided search technology and the set of the guided search web pages being defined with reference to personalization information for the user, and

computer readable program code means for providing the defined web pages to the user for display.

20 According to another aspect of the present invention there is provided the above computer program product in which the personalization information for the user includes a set of item attributes defined by a personalization system.

According to another aspect of the present invention there is provided the above computer program product in which each initial product exploration web page includes a link to a result page including a result list having an item attribute table in which attributes of a set of items are grouped to permit comparison by a user

25 According to another aspect of the present invention there is provided the above computer program product in which the set of guided search web pages includes web pages corresponding to a subset of potential guided search nodes in a guided search tree, the subset being defined with reference to the personalization information for the user.

According to another aspect of the present invention there is provided a web-based electronic commerce system for providing personalized marketing content to a user, the system including

5 means for defining a personalized web page including one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

means for defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

10 each initial product exploration web page including an entry point to a set of exploration web pages defined according to product exploration metaphor technology and the set of the exploration web pages being defined with reference to personalization information for the user, and

15 each initial guided search web page including an entry point to a set of guided search web pages defined according to guided search technology and the set of the guided search web pages being defined with reference to personalization information for the user, and

means for providing the defined web pages to the user for display.

20 According to another aspect of the present invention there is provided, in a web-based electronic commerce system for providing personalized marketing content to a user and in which web pages are provided to the user,

a personalized web page including one or more links to a set of initial product exploration web pages, the links being based on personalization information for the user,

25 each initial product exploration web page being determined based on personalization information for the user and including an entry point to a set of exploration web pages defined according to product exploration metaphor technology, and



the set of the exploration web pages being defined with reference to personalization information for the user.

According to another aspect of the present invention there is provided, in a web-based electronic commerce system for providing personalized marketing content to a user and  
5 in which web pages are provided to the user,

a personalized web page including one or more links to a set of initial guided search web pages, the links being based on personalization information for the user,

each initial guided search web page being determined based on  
10 personalization information for the user and including an entry point to a set of guided search web pages defined according to guided search technology, and

the set of the guided search web pages being defined with reference to personalization information for the user.

According to another aspect of the present invention there is provided, a  
15 computer-implemented method for providing web-based electronic commerce personalized marketing content to a user, the method including the steps of:

defining a personalized web page including one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

20 defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

each initial product exploration web page including an entry point to a set of exploration web pages defined according to product exploration metaphor  
25 technology and the set of the exploration web pages being defined with reference to personalization information for the user, and

each initial guided search web page including an entry point to a set of guided search web pages defined according to guided search technology and the set of the guided search web pages being defined with reference to personalization information for the user, and

5 providing the defined web pages to the user for display in response to requests from the user.

According to another aspect of the present invention there is provided a computer program product including a computer-readable signal-bearing medium, the medium including means for accomplishing the above method and in which the medium is a  
10 recordable data storage medium or a modulated carrier signal. In the latter case, the signal may be a transmission over a network and the network may be the Internet.

The present invention thus improves the presentation of personalized web pages to a user by providing links defined by personalization where the pages that are linked to are defined based on personalization technology and the web pages linked to implement product  
15 exploration and/or guided search technology so as to enhance the opportunity for the user to tailor information subsequently to be made available to the user on the web pages presented.

#### Brief Description of the Drawings

In drawings which illustrate by way of example only a preferred embodiment of the invention,

20 Figure 1 is a block diagram illustrating example web pages accessible in accordance with a first or a second preferred embodiment of the invention.

Figure 2 is a block diagram illustrating example web pages accessible in accordance with the first preferred embodiment of the invention.

25 Figure 3 is a block diagram illustrating an example of a personalization system in accordance with the first preferred embodiment of the invention.

Figure 4 is a flowchart showing the high level steps in the method of the first preferred embodiment of the invention.

Figure 5 is a tree diagram illustrating the structure of an example implementation of a guided search system used in a second preferred embodiment of the invention.

#### Detailed Description of the Invention

The preferred embodiment is implemented using a web-based e-commerce system.

5 The preferred embodiment provides web pages to users who run commercially available web browsers. Such browsers permit users to request and display web pages made available by a web server. In the description of the preferred embodiment, reference is made to consumers or customers (users) seeking information about products. It will be understood by those skilled in the art that the e-commerce system of the preferred embodiment (and the  
10 corresponding method) may be adapted to provide a user with access to other marketing content elements that may be of interest to the user, where the user attributes may be determined and relied on by the system in providing such access and where there are potentially multiple web pages with such marketing content elements that the user may select from.

15 Figure 1 is a block diagram illustrating schematic representations of example web pages made accessible to a user by the preferred embodiment. The delivery of marketing content elements to a consumer or user is achieved in the preferred embodiment by the user accessing web pages. In Figure 1, personalized web page 10 accessible to a customer or user is shown having product interface 12 and a set of links 14, 16, 18, 20. The size of the set of  
20 links is variable, depending on the implementation of the system and the attributes of the user accessing the system). The preferred embodiment defines personalized web page 10 using a personalization system that is part of, or accessible to, the e-commerce system of the preferred embodiment. Personalized web page 10 will typically be accessed by a customer as a potentially early step in the process of displaying information relating to a particular type of  
25 products.

The content of personalized web page 10, apart from the links referred to above, will depend on the implementation of the preferred embodiment. The content of personalized web page 10 may be the same for all customers (apart from the links) or it may vary for different customers. As an example, the preferred embodiment may be implemented to  
30 ultimately display information about a given type of consumer goods or class of industrial equipment. In the illustrated preferred embodiment, personalized web page 10 includes

CA9-2003-0031 8

product access interface 12 which is defined in a manner suitable for the class of products that the user is seeking to access. For example, as is typical, where the preferred embodiment implements a system for access to a type of consumer goods, product access interface 12 may provide, amongst other tools, a "shopping cart" for the consumer. It will be understood that the design of personalized web page 10 is application specific. The preferred embodiment system may be implemented with different personalized web page 10 designs.

In the example of the preferred embodiment shown in Figure 1, personalized web page 10 includes a set of links 14, 16, 18, 20. The display information and the URL for each of these links are defined by a personalization system. According to an implementation of the invention, the links 14, 16, 18, 20 reference a set of exploration or guided search pages 21a, 21b, 21c and 21d, respectively. In a first preferred embodiment, links on personalized web page 10 reference exploration pages and in a second preferred embodiment, the links reference guided search pages. In both cases, personalized web page 10 is defined to provide the set of links using personalization information relating to a customer or user making use of the electronic commerce system in which the invention is implemented.

The exploration or guided search pages are used to permit the customer to efficiently reach web pages with marketing content of interest. Exploration pages permit the customer to reach the pages of interest by identifying product attributes. Guided search pages permit the customer to reach pages of interest by prompting the customer for answers about the customer's characteristics and preferences. Both the product exploration and guided search pages referenced by personalized web page 10, as described in more detail below, are defined in a manner to make use of personalization information concerning customers using the e-commerce system. The personalization aspect of the system is therefore enhanced through the presentation of recommended links that provide web pages to the user which, in turn, provide content based on either product exploration technology or guided search technology (or a combination).

A first preferred embodiment is described below in which an e-commerce system uses product exploration metaphor technology to facilitate the presentation of marketing content to a customer. A second preferred embodiment is also described in which guided search technology is used.

Figure 2 is a block diagram that relates to the first preferred embodiment. In the example shown in Figure 2, personalized web page 10 and the set of links 14, 16, 18, 20 are again shown. In Figure 2, link 14 is defined to reference exploration page 22. Exploration page 22 is an implementation of product exploration technology.

5 Exploration page 22 is a web page defined by the system of the preferred embodiment and made available to a customer or customers by a web server (not shown). The page includes interface elements relating to various product attributes, shown schematically in the example of Figure 1 as product attribute elements 24, 26, 28, 30. These interface elements may be selected from different known interface technologies including  
10 check boxes, sliders, drop down menus and the like. The choice of the interface elements will be made in accordance with understood principles of interface design for the system of the preferred embodiment. The selection and initialization of these product attribute elements is described in more detail below. In the example in Figure 1, exploration page 22 is the entry point for web pages that are defined to implement a product exploration metaphor (the web  
15 pages are defined using product exploration technology).

As indicated, links 14, 16, 18, 20 shown in the example of Figure 1 are defined using a personalization system. Such systems are known in the art and are commonly utilized in electronic commerce web-based systems. Personalization permits web-based e-commerce systems to select and tailor the web pages that are made available to a customer. Figure 3  
20 shows, in a block diagram, an example architecture for a personalization system. In Figure 3 customer web browser 50 is shown with a connection to web server 52. Electronic commerce application 53 and personalization system 54 are shown as a separate processes from web server 52 in the example of Figure 2. It is understood that electronic commerce application 53 and personalization system 54 may be implemented to be resident on web server 52 or  
25 may be located on another computing platform.

Using known personalization technologies, personalization system 54 is able to obtain certain attributes relating to the customer using customer web browser 50. These are shown in the example of Figure 2 as customer attributes 56. The customer using customer web browser 50 may be identifiable based on a log-in procedure for the individual user, based  
30 on geographic information about the access path to web server 52, or based on cookies that are generated and stored in association with customer web browser 50 in accessing web  
CA9-2003-0031 10

server 52. It will also be understood by those skilled in the art that other means of accessing web server 52 other than a full-featured web browser may be used. Personalization system 54 will function if it is able to determine customer attributes 56, relating to a customer who is accessing web server 52.

5           The attributes shown in Figure 3 as customer attributes 56 may be dependent on the characteristics of product space 58. In such an implementation, personalization system 54 uses information about product space 58 to determine which aspects of the customer are potentially of interest for the personalization of the information to be presented by electronic commerce application 53 to the customer. It will be understood by those skilled in the art that  
10 other approaches to personalization may not make use of information about product space 58.

          An example of how product space 58 is used in personalization is where product space 58 relates to sporting goods. In such a case, the leisure activities of the customer will likely be an attribute captured in customer attributes 56. Alternatively, if the example product space relates to pet supplies, previous purchases of pet supplies will be an attribute to be  
15 included in customer attributes 56.

          As is discussed below and as may be seen with reference to the flow chart of Figure 4, in the preferred embodiment, personalization system 54 and product exploration system interact in a number of ways: personalization defines the links in personalized page 10, it is used to initialize preset values in exploration page 22, and it may be used to  
20 determine the attributes to be displayed in exploration page 22. Exploration system 60 provides the customer with the ability to select amongst potential recommendations otherwise made available by personalization system 54.

          As referred to above, personalization system 54 is used to define the links found on personalized web page 10 (see start step 70 and successive steps 72, 74). Customer  
25 attributes 56 for a customer accessing the system of the preferred embodiment will be used by personalization system 54 to define the set of links 14, 16, 18, 20 shown in the example of Figure 2 (as is referenced in step 72 in Figure 3). In the system of the preferred embodiment, customer attributes 56 are mapped to product attributes, based on product space 58. For the example in Figure 2, links 14, 16, 18, 20 shown on personalized web page 10 reflect product  
30 attributes defined by personalization system 54 for the customer.

Product space 58 may be defined very broadly to include different product families. A product family is a set of products to which a defined set of attributes applies. For example, the attribute "size" having potential values "compact", "mid-size" and "luxury" applies to a product family of vehicles whereas the different attribute "size" having potential values "small", "medium", "large" and "extra-large" applies to a product family of clothing.

Personalized links 14, 16, 18, 20 are defined to point to a set of exploration pages which are, in turn, defined to implement a product exploration metaphor technology. For example, in the example of Figure 2, when the user (customer) selects link 14 (see step 76 in Figure 3), exploration page 22 is presented to the user. The content of exploration page 22 is defined to allow the customer to carry out product exploration for a given family of products contained in product space 58. The product exploration metaphor system that is implemented to create exploration pages such as personalization page 22 is itself personalized, at least in part, by personalization system 54 (as referred to in step 78 in Figure 3).

As indicated above, exploration page 22 is defined to implement product exploration metaphor technology. Product exploration metaphor systems are known in the e-commerce art. They permit users (customers) to explore a product space using product attributes. In such systems a defined set of product attributes are available for presentation to a customer. The customer is able to specify desired values for the presented product attributes and the exploration metaphor system will consequently display a subset of products that meet the criteria specified by the values input by the customer for the presented product attributes. An example system used to implement such an approach is shown as product exploration system 60 in Figure 3. Product exploration system 60 defines a set of product attribute elements that are available for display to customers to permit customers to carry out the exploration of the product space.

In an exploration page, such as exploration page 22 shown in Figure 2, product attribute elements are displayed to the customer to permit the customer to select product attribute values that are of interest. Product exploration system 60 in the example of Figure 3 permits a customer to specify attributes of interest and therefore the information about products available to the customer is able to be appropriately filtered or tailored by e-commerce system. Those products meeting the attribute values specified by the customer may be displayed to the customer in preference to other products.

In the preferred embodiment, personalization system 54 interacts with product exploration system 60 to provide enhanced presentation of content to a user of an e-commerce system.

Personalization system 54 provides certain preset values for the product attribute elements displayed on exploration page 22. As described above, personalization system 54 determines a set of product attribute values for the product attribute elements displayed on exploration page 22. These values are determined by personalization system 54 as being values appropriate for the current customer using the system, based on that customer's attributes. This set of product attribute values is passed to product exploration system 60 to allow that system to preset some of the product attribute values used when the exploration page 22 is displayed.

This allows the consumer to explore the products of interest with some attributes pre-specified based on the personalization system. In the preferred embodiment, personalization system 54 constructs a link for display on a web page in association with appropriate messages. The link references product exploration system 60 and includes preset product attribute values. As an example, where product attribute presets are for products recommended for seniors, with a price under fifty dollars and with an overstock indicator ("OS"), the URL for the link in the preferred embodiment has the form:

`http://hostname/...../ProductExploration?category=Senior&price<50&inventory=OS`

When the consumer clicks on the link (one of links 14, 16, 18, 20 in the example of Figure 2), exploration page 22 is displayed with category, price, and inventory pre-specified as indicated. In this manner, the personalization approach is combined with the product exploration approach to provide an improved system for the consumer.

As set out above, product exploration system 60 defines certain product attribute elements that are potentially displayed to the consumer. In the preferred embodiment, personalization system 54 also personalizes which of these product attribute elements are displayed to the consumer. For example, with reference to the above personalized link, the pre-specified inventory attribute may be hidden from the consumer (the appropriate product attribute element will not be displayed). This will be the case where the vendor does not wish



to reveal to the consumer the fact that the item is overstocked nor to allow the shopper to change the pre-specified value of this attribute. In contrast, when the price attribute is displayed the consumer is free to change its value to see which products now meet this new price value.

5           In this way the system of the preferred embodiment provides the convenience of pre-selected values in the product attribute elements while permitting the consumer to use product attribute elements 24, 26, 28, 30 to redefine those attribute values when appropriate.. For example, personalized web page 10 has link 14 that relates to automobiles, exploration page 22 may predefine car attributes such as price and other vehicle option while permitting  
10   the consumer to select different attribute values where the preset values are not appropriate. Once these attributes are defined using one or more of product attribute elements 24, 26, 28, 30, in the example of Figure 2, the user may select show products button 32. This causes the system of the first preferred embodiment to select information that meets the criteria and to display that information to the user. In the example of Figure 1, this is achieved by providing  
15   result page 34. This page contains product list 36 having information and links to product pages for products that meet the criteria. In the first preferred embodiment example shown in Figure 1, product list 36 includes product attribute table 37. Entries in product attribute table 37 include product attribute information and appropriate links to product pages that provide further information about products. The inclusion of product attribute information in product  
20   attribute table 37 permits a straightforward comparison of the values of the listed attributes for the different available products. A schematic example product page 38 is shown in the example of Figure 2.

          Using the automobile example referred to above, the user may use product attribute elements 24, 26 to define a 2-door sedan with a cost above \$50,000. After selecting  
25   (clicking on) show products button 32 the preferred embodiment searches the information available and provides access to result page 34 showing product list 36 listing further links for vehicles that meet the criteria of the user. The user may follow one of these links in product list 36 to view information about a specific vehicle shown on product page 38. In addition, in the preferred embodiment, the product list is in a comparison table showing product attributes  
30   for the different products. This provides the consumer with a easily understood comparison between the products, based on attributes likely to be of interest to the consumer.

As will be appreciated by those skilled in the art, this arrangement of result page 34 and product page 38 is one of the available approaches to displaying the detailed information. Another of the possible designs for the display of the information is to have more detail available on result page 34 such that a further link to a product page 38 is unnecessary.

The approach of the first preferred embodiment permits marketing content to be presented using a combination of personalization technology and product exploration technology.

Once a customer has chosen different attributes from those displayed on exploration page 22, the customer may select show products button 32 (see step 80 in Figure 3). In the example shown in Figure 2, result page 34 is displayed (corresponding generally to step 82 in the flow chart of Figure 4). Result page 34 contains product list 36 having products relating to the criteria defined by the attributes selected by the customer in exploration page 22 (and with other, non-displayed attributes, as described above). This list may contain numerous product details or may contain summary details and links to more detailed pages. The example of Figure 2 shows the latter arrangement. An item on product list 36 in Figure 2 contains a link to product page 38 having more details about the product of interest.

In the system of the first preferred embodiment, product list 36 is presented in a tabular format in which a short description of each product on the list is coupled with a link to a product page. The first preferred embodiment is able to present products to the user in this convenient tabular format after the user has indicated product attributes of interest. Thus the tabular presentation is expected to include only products in which the user is likely to be interested.

In each of the above implementations of the first preferred embodiment of the invention, personalization technology is combined with technology utilizing a product exploration metaphor to provide a user with efficient and detailed access to information about products within the set that is initially recommended by the personalization system. A second preferred embodiment is also described below. This second embodiment combines personalization technology with technology based on a guided search metaphor. In the guided search technology, prompts are provided to customers or users. The answers provided

by the customer are used to reach other prompts and, eventually, web pages displaying marketing content. The structure of the guided search may be represented by a tree in which prompts are nodes in the tree, as are web pages displaying marketing content. In the second embodiment, described in more detail below, the prompts themselves are provided by way of web pages displayed to the customer.

Figure 5 is a tree diagram showing schematic representations of logical relationships between different web pages that are potentially displayed to a user in an example system of the second preferred embodiment. An initial web page that prompts for user information is shown as prompt 90 in Figure 5. This initial web page is, in the example of Figure 5, the entry point for a set of web pages that define a guided search for a user. The response received from a user causes the system of the second preferred embodiment to make available one of either prompt 92 or prompt 94. Similarly, information provided from a user in response to prompt 94 causes one of either web pages 96, 98 to be displayed to the customer. In this way the marketing content of interest to the consumer is displayed. In the guided search technology, such as that shown by example in Figure 5, marketing content is presented to a user (consumer) based on the user's response to prompts (questions). The system implementing the guided search technology resolves the user's response into a set of product attributes that are, in turn, used to influence the scope for the search.

Figure 5 illustrates the manner in which a guided search is facilitated by the system of the second preferred embodiment. Initial web pages, represented as prompts 90, 92, 94, prompt for and obtain information from a user that guides the user to either further prompting web pages (for example, web pages 92, 94), or to web pages containing content (for example web pages 96, 98). Other, more complex, examples may mix web pages that prompt for user information with web pages that presents content to the user. It will also be understood that the simple binary tree shown in the example of Figure 5 provides ease of presentation of the second preferred embodiment and that in practice the tree structure representing an implementation of the system will likely be much more complex.

In the example of Figure 5, prompt 92 is shown with dependent nodes in the tree corresponding to prompts 100, 102. These in turn have dependent nodes comprising web pages 104, 106 (dependent on prompt 100) and web pages 108, 110 (dependent on prompt 102). As is described above, each of the nodes in the tree diagram of Figure 5 represents a

web page displayable to a user. The maximum number of prompt pages actually displayed in a given search is typically determined by how far down the tree the search proceeds (in the simple example of Figure 5, one page is may be displayed per level in the tree). In the second preferred embodiment certain prompts are effectively skipped as a result of information being  
 5 made available by the personalization system.

In the second preferred embodiment, the logic defining the display of the prompt node web pages accesses a personalization system or information derived from a personalization system. The guided search is utilized to further refine the results available from the personalization system. The guided search system that is implemented uses a subset  
 10 of the defined guided search question/answer tree (represented in the example of Figure 5). This subset is based on a set of product attributes made available from the personalization system. The tree is effectively pruned to a subset of the full tree by reference to product attributes made available by the personalization system.

For example, in Figure 5, prompt 92 may seek confirmation of a particular user  
 15 attribute before selecting to display one of the two prompting web pages shown as prompts 100, 102. The attribute may be, for the sake of illustration, whether the user is a car owner. The web page for prompt 92 could contain a prompt seeking to elicit an answer to the question "do you own a car?" The guided search system logic will resolve the response to a product attribute corresponding to the answer provided to the prompt. For example, the user  
 20 attribute "car owner" may resolve to the product attribute "heavy tent" when the guided search is presents marketing content relating to camping equipment. Where a prompt is seeking information that will resolve to a product attribute that is already determined by the personalization system, that prompt is redundant and the system of the preferred embodiment will skip the node in the tree that relates to that prompt (in this way effectively pruning the  
 25 question / answer tree of the guided search). In the above example, the product attribute "heavy tent" may be already determined and made available from the personalization system. The personalization system may, for example, derive the product attribute "heavy tent" from the fact that the user has bought other heavy camping equipment in the past. In such a situation, even though the system has no knowledge of whether the user is a car owner,  
 30 prompt 92 is not used by the guided search as the underlying product attribute ("heavy tent") is determined by the personalization system.

Instead, the system of the second preferred embodiment will choose to traverse the tree of Figure 5 by using the information made available in the personalization system to select one of the nodes prompt 100, 102. In other words, the guided search tree will be traversed using product attribute information made available by the personalization system,  
5 where possible.

As will be apparent, combining the personalization system with the guided search system gives a system that presents information to the user that is more useful than is the case with the personalization system alone. The set of recommendations otherwise obtainable by the personalization system is presented in a manner that is potentially more directly of use by  
10 the consumer. The guided search component of the system is itself enhanced by the availability of product attribute information from the personalization technology implemented in the system. Rather than the user expressly answering prompts to move through the guided search system, the system traverses certain portions of the tree based on information about the products likely to be of interest, the information having been made available by the  
15 personalization system.

The second preferred embodiment may be designed such that personalization information of interest will be passed to the guided search technology portion of the system when that portion of the system commences execution. Referring again to Figure 1, when one of links 14, 16, 18, 20 in personalized web page 10 are followed to reach a guided search  
20 page (one of pages 21a, 21b, 21c, or 21d, respectively), information available about the user that is relevant to the guided search associated with those guided search pages will be passed to the application that implements the guided search technology for the appropriate page.

As may be seen from the above description of the two preferred embodiments, the systems and methods for each embodiment rely on a personalized web page with personalized  
25 links referencing exploration or guided search pages relevant to the personalized links and in which the appropriate product exploration technology or guided search technology makes use of information available from the personalization system. In this way, the marketing content that the e-commerce system presents to a customer or user is tailored for that particular customer or user. For the customer or user the marketing content is more efficiently  
30 presented.

Various embodiments of the present invention having been thus described in detail by way of example, it will be apparent to those skilled in the art that variations and modifications may be made without departing from the invention. The invention includes all such variations and modifications as fall within the scope of the appended claims.

## WHAT IS CLAIMED IS:

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A computer program product for providing web-based electronic commerce personalized marketing content to a user, the computer program product comprising a computer usable medium having computer readable program code means embodied in said medium, and comprising

computer readable program code means for defining a personalized web page comprising one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

computer readable program code means for defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

each initial product exploration web page comprising an entry point to a set of exploration web pages defined according to product exploration metaphor technology and the set of said exploration web pages being defined with reference to personalization information for the user, and

each initial guided search web page comprising an entry point to a set of guided search web pages defined according to guided search technology and the set of said guided search web pages being defined with reference to personalization information for the user, and

computer readable program code means for providing the defined web pages to the user for display.

2. The computer program product of claim 1 in which the personalization information for the user comprises a set of item attributes defined by a personalization system.

3. The computer program product of claim 2 in which each initial product exploration web page comprises a link to a result page.
4. The computer program product of claim 3 in which the result page comprises a result list
5. The computer program product of claim 4 in with the result list comprises an item attribute table in which attributes of a set of items are grouped to permit comparison by a user.
6. The computer program product of claim 2 in which the set of guided search web pages comprises web pages corresponding to a subset of potential guided search nodes in a guided search tree, the subset being defined with reference to the personalization information for the user.
7. A web-based electronic commerce system for providing personalized marketing content to a user, the system comprising
 

means for defining a personalized web page comprising one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

means for defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

each initial product exploration web page comprising an entry point to a set of exploration web pages defined according to product exploration metaphor technology and the set of said exploration web pages being defined with reference to personalization information for the user, and

each initial guided search web page comprising an entry point to a set of guided search web pages defined according to guided search technology and the set of said guided search web pages being defined with reference to personalization information for the user, and



means for providing the defined web pages to the user for display.

8. The system of claim 7 in which the personalization information for the user comprises a set of item attributes defined by a personalization system.
9. The system of claim 8 in which each initial product exploration web page comprises a link to a result page.
10. The system of claim 9 in which the result page comprises a result list.
11. The system of claim 10 in which the result list comprises an item attribute table in which attributes of a set of items are grouped to permit comparison by a user.
12. The system of claim 8 in which the set of guided search web pages comprises web pages corresponding to a subset of potential guided search nodes in a guided search tree, the subset being defined with reference to the personalization information for the user.
13. In a web-based electronic commerce system for providing personalized marketing content to a user and in which web pages are provided to the user,  
  
a personalized web page comprising one or more links to a set of initial product exploration web pages, the links being based on personalization information for the user,  
  
each initial product exploration web page being determined based on personalization information for the user and comprising an entry point to a set of exploration web pages defined according to product exploration metaphor technology, and  
  
the set of said exploration web pages being defined with reference to personalization information for the user.
14. In a web-based electronic commerce system for providing personalized marketing content to a user and in which web pages are provided to the user,

a personalized web page comprising one or more links to a set of initial guided search web pages, the links being based on personalization information for the user,

each initial guided search web page being determined based on personalization information for the user and comprising an entry point to a set of guided search web pages defined according to guided search technology, and

the set of said guided search web pages being defined with reference to personalization information for the user.

15. A computer-implemented method for providing web-based electronic commerce personalized marketing content to a user, the method comprising the steps of:

defining a personalized web page comprising one or more links to initial product exploration or guided search web pages, the links being based on personalization information for the user,

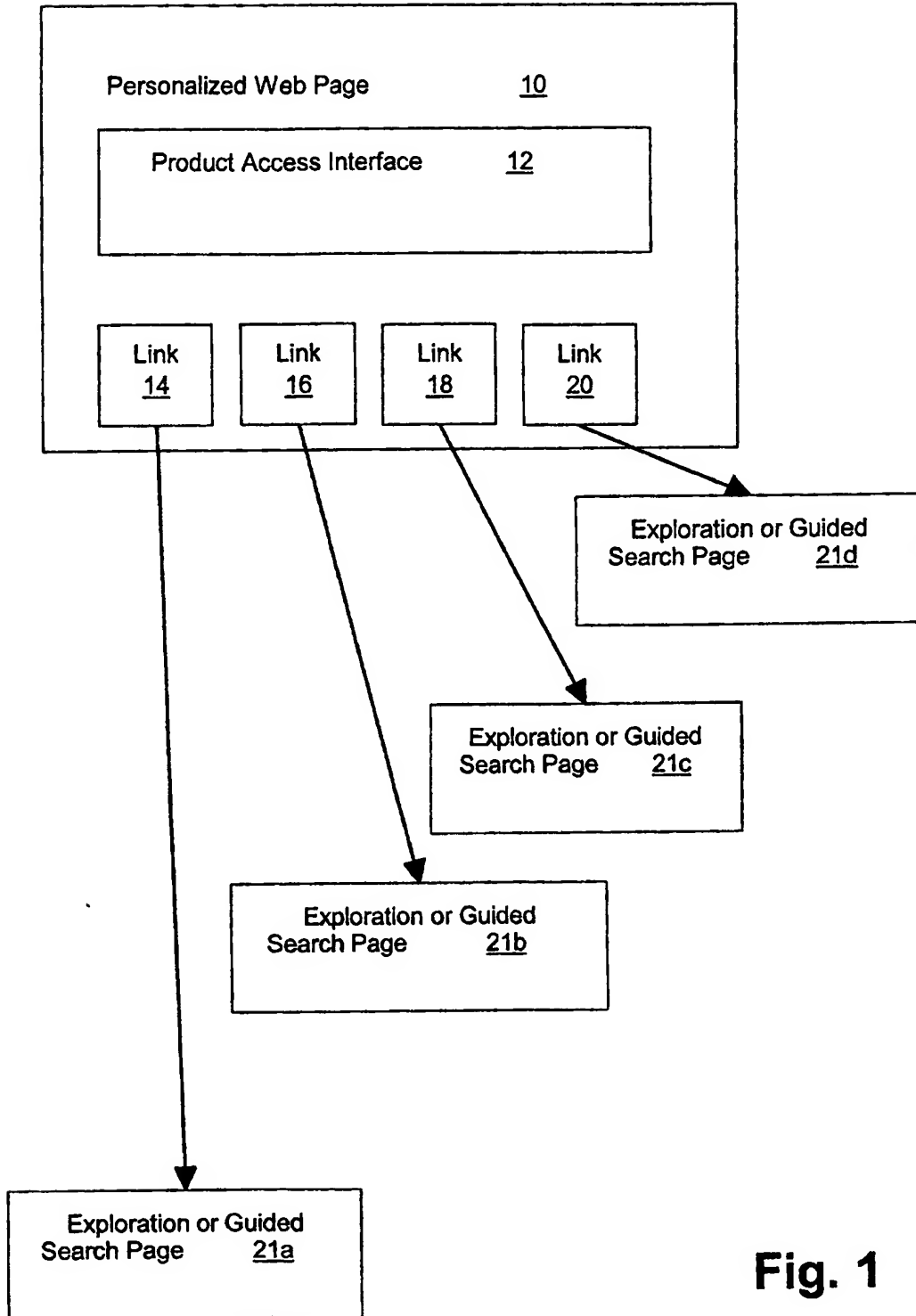
defining the one or more initial product exploration or guided search web pages, each initial product exploration or guided search web page being determined based on personalization information for the user,

each initial product exploration web page comprising an entry point to a set of exploration web pages defined according to product exploration metaphor technology and the set of said exploration web pages being defined with reference to personalization information for the user, and

each initial guided search web page comprising an entry point to a set of guided search web pages defined according to guided search technology and the set of said guided search web pages being defined with reference to personalization information for the user, and

providing the defined web pages to the user for display in response to requests from the user.

16. The method of claim 15 in which the personalization information for the user comprises a set of item attributes defined by a personalization system.
17. The method of claim 16 in which each initial product exploration web page comprises a link to a result page.
18. The method of claim 17 in which the result page comprises a result list.
19. The method of claim 18 in with the result list comprises an item attribute table in which attributes of a set of items are grouped to permit comparison by a user.
20. The method of claim 16 in which the set of guided search web pages comprises web pages corresponding to a subset of potential guided search nodes in a guided search tree, the subset being defined with reference to the personalization information for the user.
21. A computer program product comprising a computer-readable signal-bearing medium, the said medium comprising means for accomplishing the method of any of claims 15 to 20.
22. The computer program product of claim 21 in which the medium is a recordable data storage medium.
23. The computer program product of claim 21 in which the medium is a modulated carrier signal.
24. The computer program product of claim 21 in which the signal is a transmission over a network.
25. The computer program product of claim 24 claim in which network is the Internet.



**Fig. 1**

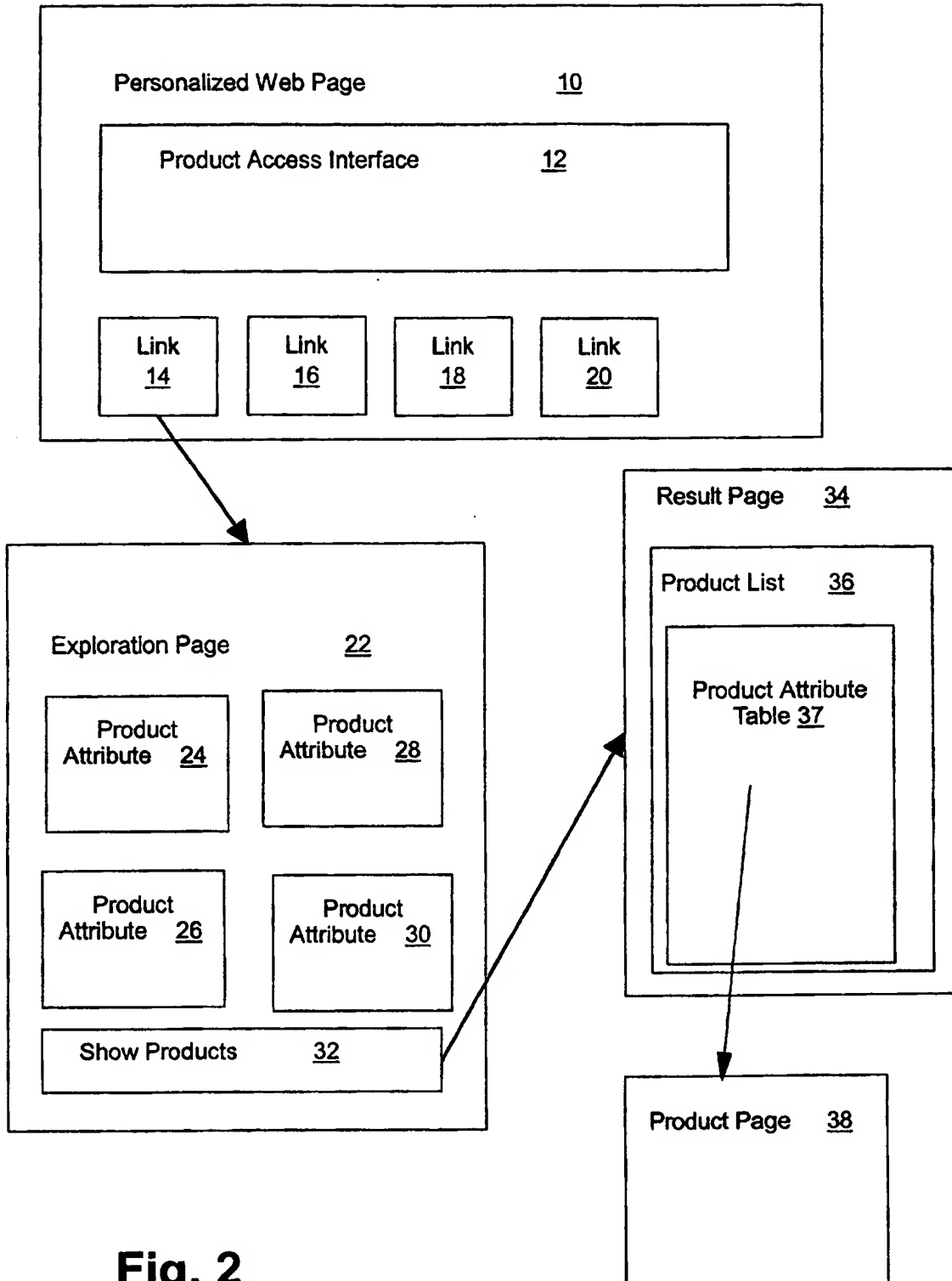
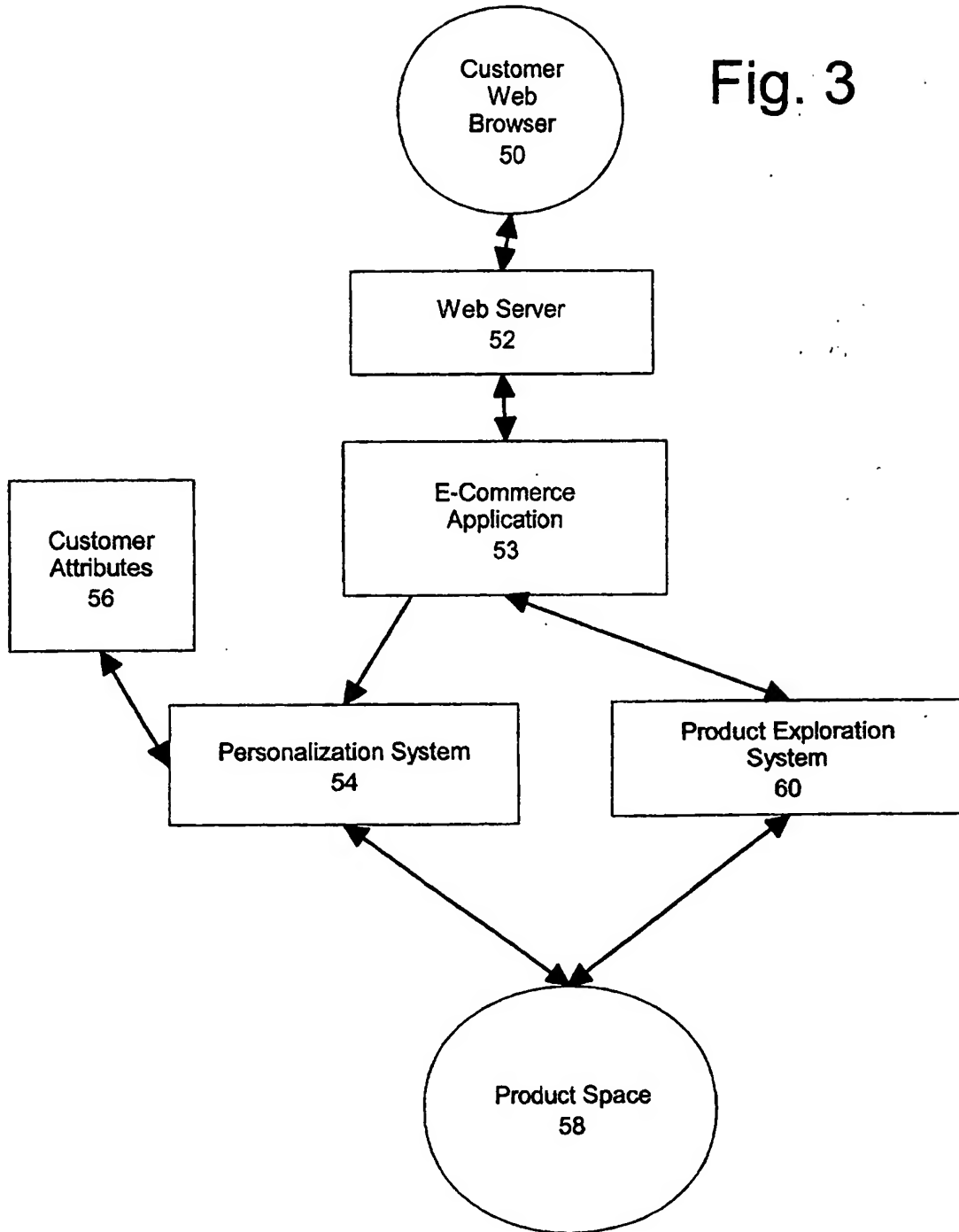
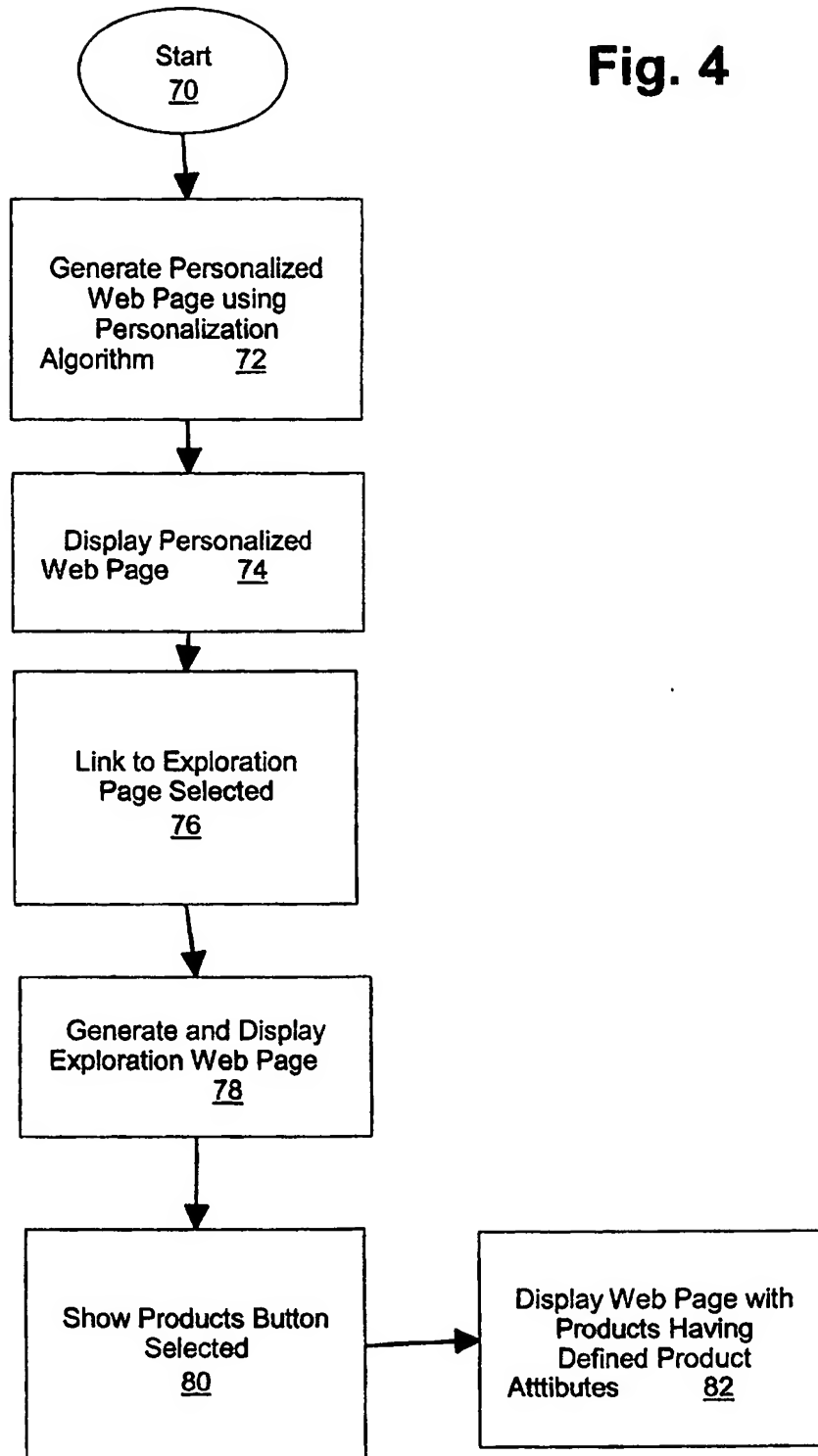
**Fig. 2**

Fig. 3



**Fig. 4**

**Fig. 5**